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RECENTLY PUBLISHED RESEARCH OF THE LENINGRAD STATE OPTICAL INSTITUTE

"The Theory of Hydrogen Bond: I. Explanation of the Regularities in the Spectra of Molecules Forming a Hydrogen Bond, by the Predissociation Effect,"
B. I. Stepanov, Leningrad State Opt Inst

"Zhur Fiz Khimii" Vol 19, 1945, pp 50-14

The spectrum of the H bond is discontinuous as long as the O-H link is in the normal state. When this link is excited, a continuous sequence of energetically unstable states is possible for the H bond. However, only those transitions from a stable to an unstable state are probable which leave unaffected the O atoms in the system O-H...O. On this basis it is possible to explain the diffuse bands due to H bonds in liquids and their shifts due to substitution of D for H and to temperature variations.

"The Theory of Hydrogen Bond: II. Explanation of the Regularities in the Spectra of Molecules Forming a Hydrogen Bond, by the Predissociation Effect,"
B. I. Stepanov, Leningrad State Opt Inst

"Zhur Fiz Khimii" Vol 20, 1946, pp 907-15

The explanation given previously is put on a quantitative basis. The Schrodinger equation for the system OH ... O is solved in Jacoby's coordinates and the result accounts for the effect of the H bond on the width and position of spectrum lines at various temperatures.

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"Characteristic Frequencies in the Spectra of
Complicated Branched Paraffins," B. I. Stepanov,
Leningrad State Opt Inst.

"Zhur Fiz Khimii" Vol 20, 1946, pp 917-28

The theoretical and experimental Raman frequencies of normal paraffins are compared with those of branched paraffins. Normal paraffins have the lines 1140 (4) and 1160 (1), the numbers in the parentheses meaning the intensity on an arbitrary scale. Isoparaffins show the lines 1140 (4) and 1170 (4). Paraffins of the $C(CH_3)_4$ type have intensive lines in the region 1,200-1,250. Branching at the end of a chain causes appearance of a frequency near 925. The determination of the structure of a branched paraffin from its Raman spectrum is illustrated by several examples.

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